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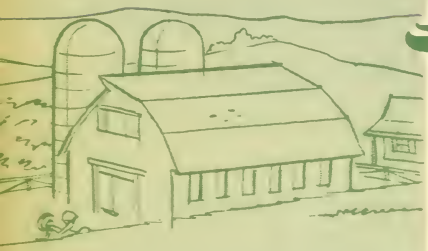
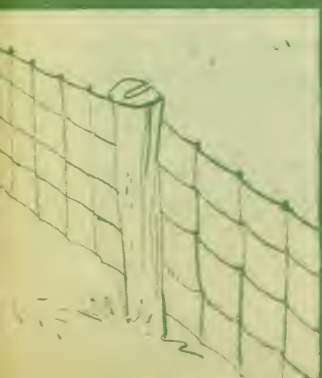


Marketing Costs and Margins for Fresh Milk

USDA
MAR 20 1959

U. S. DEPARTMENT OF AGRICULTURE · AGRICULTURAL MARKETING SERVICE



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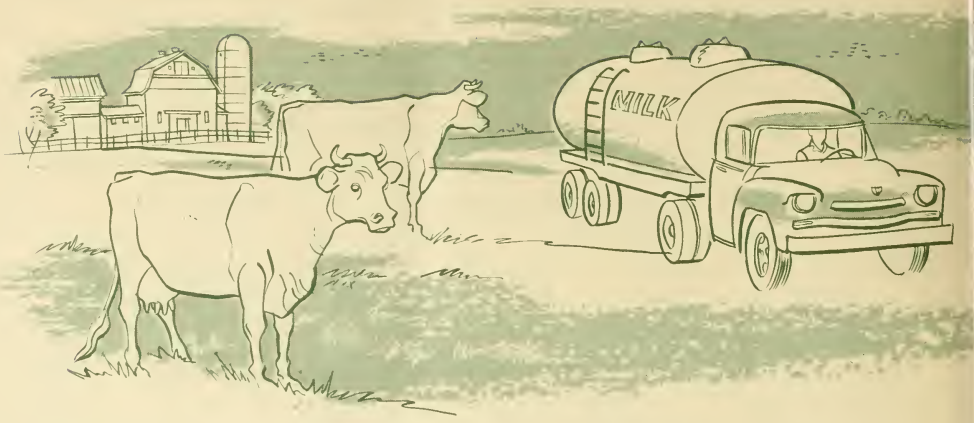


Preface

This report provides a brief description of the marketing of fresh (or fluid) milk, of the cost of performing the various marketing operations, and of variations in these costs and in the price spread between farmers and consumers. It is one of several reports from the Marketing Research Division, Agricultural Marketing Service, about the way food products are marketed and about marketing costs and margins.

Congress has directed the United States Department of Agriculture to make these studies, as one means of trying to improve the market for farm products.

Estimates of marketing costs in this report are based mainly upon data presented in previous studies of marketing fluid milk in various parts of the country. These studies were made by State agricultural colleges and the U. S. Department of Agriculture.

Retail prices of fluid milk given in this report are weighted averages of prices published by the Bureau of Labor Statistics for milk delivered to homes and sold in retail stores. Since purchases of 1 quart generally are the most common, price quotations on single-quart purchases predominate in the price samples collected by the BLS. Prices of milk in gallon containers are not collected. In some areas, the price of milk per quart when it is purchased 2 or more quarts at a time is lower than the price of a single quart. The retail price averages in this report are, therefore, somewhat higher than prices of all milk purchased by consumers.

The Marketing Research Division is studying marketing costs and margins on all types of sales of milk to consumers in several cities, to determine the relationship between margins for single quarts and margins for all purchases.

Current farm-retail price spread data for fresh milk are published quarterly in The Marketing and Transportation Situation.

The "Farm-Retail Price Spread"

The difference between the average price that consumers pay for a quart of milk and the payment the farmer receives for an equivalent quantity (2.18 pounds) of Class 1 milk is the "price spread." It includes all charges for assembling, processing, and distributing fresh fluid whole milk. The payment received by the farmer is called the "farm value."

The average price paid by consumers for a quart of fresh whole milk went up more than one-fourth from 1947 to 1957. But the average price received by farmers for milk was about the same in both years.

The cost of marketing milk is much higher now than it was in 1947, the first year after removal of wartime price ceilings.

Because of the increase in marketing costs, farmers received 45 percent of the price consumers paid in 1957 compared with 55 percent in 1947.

Consumers paid about 1.0 cent more, on the average, for a quart of milk in the fall of 1957 than a year earlier. About one-fifth of this increase went to farmers and the other four-fifths went to marketing firms.

Charges for hauling milk from farms to processing and bottling plants amounted to about 5 cents of the dollar spent by consumers for milk in 1957. Processing and bottling costs made up 18 cents; distribution costs, 23 cents; and management costs, 5 cents. Marketing firms received 4 cents of the consumer's dollar in profits. Thus, marketing costs and profits represented 55 cents of the consumer's milk dollar in 1957. The rest—45 cents—was received by farmers.

Wages, salaries, commissions, and other costs of employing the marketing workers accounted for 27 cents of the consumer's dollar in 1957. Depreciation, property taxes, insurance, and other expenses made up 7 cents; bottles and paper cartons accounted for 7 cents; and fuel, electric power, advertising, and other expenses for 10 cents.

Marketing fresh milk includes three major functions—assembly, processing, and distribution. Most milk marketing firms perform all three functions. However, a few firms operate only country plants which assemble milk that is shipped to other plants for processing. A few firms only process milk, and a few buy milk from processors and perform only the distribution function. Firms that specialize in marketing milk generally are called "milk dealers." A little more than half of the fluid milk is sold to consumers through retail stores. The costs and profits of these stores in handling milk are a part of the marketing margin.

Assembly

The average cost of assembling milk at processing plants in 1957 is estimated at 5 cents of the dollar spent for fresh milk by urban consumers in the United States (fig. 1). This 5 cents includes the cost of hauling milk from farms and receiving it at processing plants and charges of country receiving plants. Assembly costs in cents per quart vary widely among markets, partly because of differences in the average distance milk is hauled. Charges for hauling account for most of the assembly cost.

On some farms, milk is put into 10-gallon cans which are picked up at the farm by a truck on a regular collection route. On other farms, the milk is put in refrigerated tanks where it is stored until it is pumped into a tank truck for delivery to the plant.

In recent years, the assembly of milk from farms by tank truck has become common in many parts of the country. The van trucks in which cans are hauled and the tank trucks are owned by individual milk haulers, trucking firms, farmers' cooperative organizations, or, in some instances, the milk dealers.

Charges for hauling usually are deducted by the milk dealer from the price paid the farmer for milk.

Milk that is delivered in cans is weighed when received at the plant, inspected for quality, sampled and tested for butterfat content, and

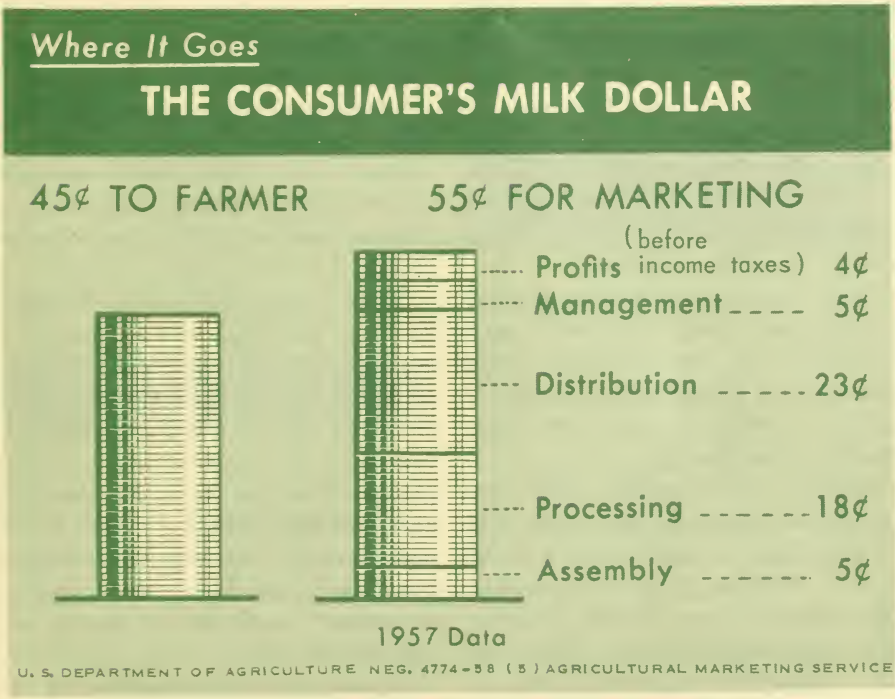


FIGURE 1.

poured into a tank where it is cooled and held for processing. Other assembly operations include recording the receipts from each dairy farmer, washing cans, moving them to a loading platform, and loading them on the milk delivery trucks which return them to the dairy farms.

Milk that is received in tank trucks is pumped directly into the plant storage tank. The tasks of weighing and sampling are performed by the truck driver when the milk is loaded at the farm.

Most milk is delivered directly from the farm to the plant where it is processed and bottled. But New York, Chicago, Boston, and a few of the other larger cities receive milk from longer distances than are feasible for direct shipments from farms. This milk is delivered to country receiving plants where it is weighed, sampled, cooled, and stored until it is shipped in large tank trucks or railroad tank cars to processing plants in or near the city. Many of these country plants are owned and operated by the firms that operate the city plants to which the milk is shipped.

The rapidly expanding use of refrigerated tanks on farms and collection by tank trucks make longer direct hauls more economical, and the number of country receiving stations is declining.

Because of the weight, bulk, and perishable nature of milk, the cost of shipping it is high relative to its value. Regular shipments of more than 400 miles are seldom made to even the largest cities. Occasionally, however, shipments from a considerably greater distance are necessary to supply some cities. When milk production declines during the fall, shipments must be made from a greater distance than during the earlier part of the year.

Many dairy firms and farmers' cooperatives employ fieldmen who aid dairy farmers in maintaining the quality of the milk, solicit patrons, and perform other functions to assure an adequate supply of wholesome milk.

Processing

It is estimated that in 1957 the cost of processing and bottling milk represented about 18 cents of the dollar paid by consumers. Wages and salaries made up about a third of this cost and containers accounted for another third. Expenses connected with plant and equipment, such as depreciation, repairs, insurance, property taxes, interest, and rent, accounted for about one-fourth of the total processing cost. The remainder included electric power, fuel, water, various supplies, and miscellaneous costs.

Many plants run the milk through vacuum pasteurizers and clarifiers to remove any undesirable odors or foreign material. Many standardize or adjust the butterfat content to a uniform percentage. Most plants pasteurize the milk to destroy any disease-producing bacteria it may contain. After pasteurization, the milk is cooled and put in bottles or paper containers by means of mechanical fillers.

In many plants a part or all of the milk is homogenized. In this

process, milk is forced under pressure through small openings in a metal plate and the globules of butterfat are greatly reduced in size. Homogenization causes the butterfat to remain evenly distributed throughout the milk and improves the flavor.

Vitamin D may be added during processing. Formerly this was done by causing the milk to flow under an ultraviolet light. Now vitamin-D concentrate is usually added to the milk.

In performing the various processing operations, great care must be taken to prevent milk from becoming contaminated and to maintain its quality. Much of the time of workers is spent in cleaning plant and equipment and in washing cans, bottles, and other containers. Milk is usually sold to consumers within a few days after it is produced. It is cooled soon after milking, and, during most of its journey to the consumer, is kept under refrigeration. Many plants maintain laboratories in which samples of milk are tested for the presence of bacteria and for butterfat content and other properties that determine quality.

Selling & Delivering

Costs of selling and delivery accounted for about 23 cents of the consumer's milk dollar in 1957, or approximately two-fifths of the marketing margin. Wages and salaries, on the average, amounted to about 70 percent of the total selling and delivery cost, with the proportion larger for deliveries to homes and smaller for sales through retail stores. Expense of operating delivery trucks, including depreciation, gasoline, and tires, was the next largest item. Advertising was another item of some importance.

Distribution of fluid milk is predominantly a local enterprise. The bulk of the milk processed by most plants is distributed within the locality in which the plant is situated. However, the distance that consumer-packaged milk is regularly distributed has increased greatly in recent years, extending in some instances to several hundred miles. The use of paper containers and improved means of refrigeration during transit have made long-distance shipments feasible. Paper containers are lighter, may be loaded more compactly, and keep milk cooler than glass bottles. Their use has made distance a less important element of distribution cost.

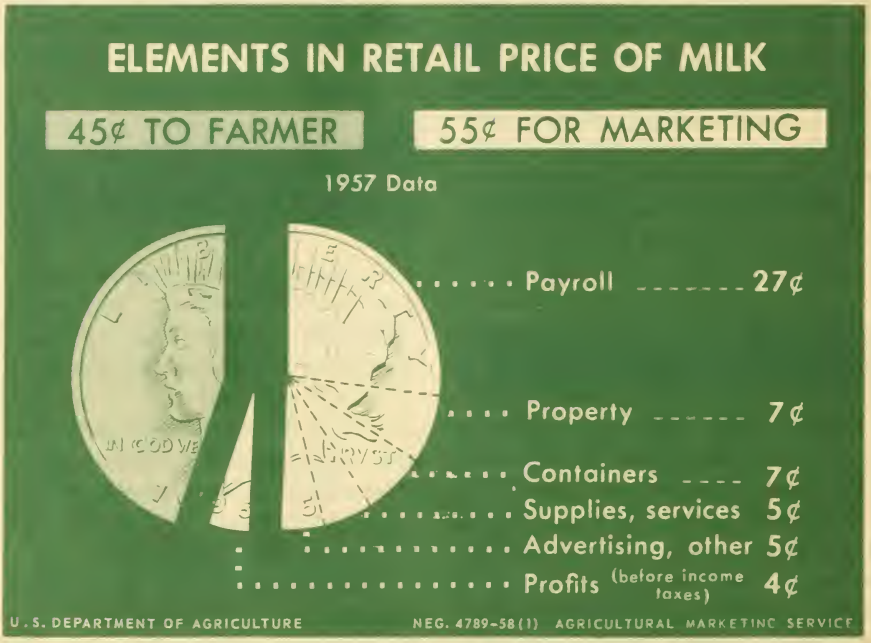
Management & Miscellaneous Costs

Management costs and various expenses which were not connected specifically with any of the other functions accounted for about 5 cents of the consumer's dollar. Salaries of managers and of accountants, stenographers, and various other office workers accounted for about 70 percent of the total of this group of expenses.

Costs of employing the workers engaged in marketing made up 27 cents of the dollar spent by consumers for milk in 1957 (fig.

2). Besides wages, salaries, and commissions, this cost included payroll taxes, employers' contributions to pension funds, and the cost of other "fringe benefits." Depreciation, property taxes, insurance, and other property expenses accounted for 7 cents of the consumer's dollar, containers for 7 cents, and other purchased supplies and services for 5 cents. Advertising and other sales promotion and miscellaneous expenses amounted to 5 cents.

Building and equipping even a small plant for processing fluid milk and the usual related products (fluid cream, skim milk, chocolate drink, and so forth) require a considerable investment. It has been estimated that in the northeastern region of the United States in 1952 approximately $200,000 would have been required for a plant that can handle 15,000 quarts daily.



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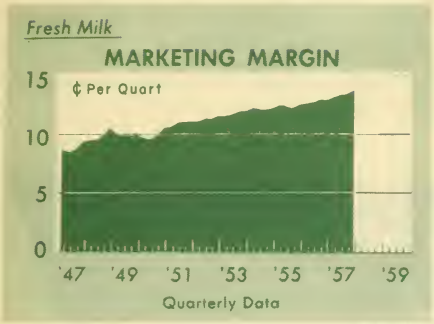

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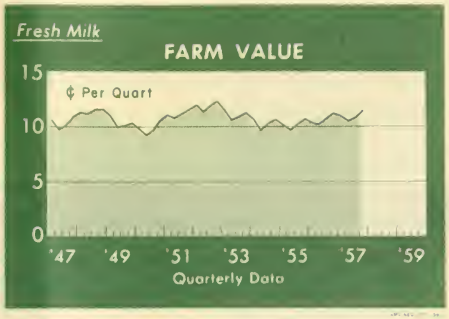

FIGURE 4.

The combined profit that milk dealers and retail stores made on fluid milk amounted, on the average, to approximately 4 cents of the consumer's dollar in 1957. This was before deduction of income taxes. For some of the larger corporations that market fluid milk, income taxes amounted to slightly more than 50 percent of net income. Dealers received the larger part of the profit on milk sold through retail stores. But they performed more of the marketing services than the retailers.

The total of these costs and profits (before taxes) is the marketing margin. In 1957 it made up 55 cents of the consumer's dollar. The remainder, 45 cents, was received by the dairy farmer.

A somewhat larger quantity of milk is bought from farmers than is sold to consumers because some is lost during marketing. The farm value is based upon prices that farmers received for what is usually called Class I milk, that which is to be sold to consumers mostly as fluid whole milk.

Most urban areas have regulations to prevent the sale of unwholesome milk. These regulations permit farmers to sell milk for fluid use only if their dairy barns and equipment comply with certain sanitary standards. Many State or local regulations require periodic inspection of cows.

Because of these regulations, it is more expensive to produce milk for fluid consumption than milk that is used in butter, cheese, and

FIGURE 5.

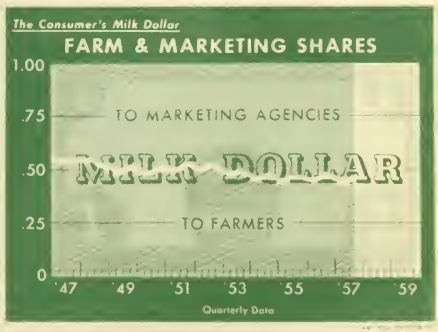

FIGURE 6.

other manufactured dairy products. Frequently, however, not all milk that is eligible can be sold for fluid consumption. Part of it must be used in manufactured products. Dairy farmers receive a lower price for milk used in manufactured products.

THE POSTWAR INCREASE IN PRICE SPREAD

The farm-retail price spread for fresh milk reached its first post-World War II peak in November 1948 (fig. 3 and table 1). At that time it was 27 percent hgher than in May 1947, when the upward trend began. During 1949 and the first half of 1950, the trend was downward. In April–June 1950, the spread was 10 percent below the 1948 peak. In July 1950, following the outbreak of the Korean conflict, another upward trend began. The spread increased rapidly until June 1951. Since then, advances have been interrupted by sidewise movements and occasional small declines, but the trend has been gradually upward. In the fourth quarter of 1957, the spread was 40 percent higher than in the fourth quarter of 1950.

Until 1953, the trend in the price received by farmers for milk was in the same direction as the trend shown (fig. 4). For this reason, the retail price tended to change more than the farm value (fig. 5). The spread, however, did not decrease as much as the farm value during the November 1948–June 1950 period, or rise as much from July 1950 to November 1952, when the farm value reached its post-World War II peak. Because of the smaller variation in the marketing margin, the farmer's share of the retail price of milk (and of the consumer's milk dollar) decreased from 54 percent in the second quarter of 1948 to 49 percent in the second quarter of 1950, then rose to 52 in the final quarter of 1952 (fig. 6).

In 1953 and in the first half of 1954, the trend in the farm value was downward. A slight upward trend has occurred since mid-1954. Since the upward trend in the price spread continued, the farmer's share of the retail price decreased from 52 percent in 1952 to 45 percent in 1957.

The production of milk reaches a peak during the spring when pastures are lush. Prices received by farmers for milk decline when production is increasing and recover in the second half of the year when production decreases. During the years 1947–57, the retail price generally changed when the farm value did or shortly afterward. The price spread did not vary seasonally. Increases in the spread since 1950 have not been large enough to offset normal seasonal decline in farm value during the spring, so retail price has varied in the same direction as farm value.

Table 1—Fresh milk: Average retail price per quart, farm value, marketing margin, and farmer's share of retail price, by quarters, 1947-57

Year and quarter		Retail price[1] (Cents)	Farm value[2] (Cents)	Farm-Retail Price Spread[3] (Cents)	Farmer's share (Percent)
1947	Average	19.0	10.3	8.7	54
1948	Jan.-Mar.	20.6	11.2	9.4	54
	Apr.-June	20.5	11.1	9.4	54
	July-Sept.	21.4	11.5	9.9	54
	Oct.-Dec.	22.0	11.5	10.5	52
	Average	**21.1**	**11.3**	**9.8**	**54**
1949	Jan.-Mar.	21.0	11.0	10.0	52
	Apr.-June	19.9	10.0	9.9	50
	July-Sept.	20.0	10.1	9.9	50
	Oct.-Dec.	20.2	10.3	9.9	51
	Average	**20.2**	**10.3**	**9.9**	**51**
1950	Jan.-Mar.	19.6	9.9	9.7	51
	Apr.-June	18.8	9.3	9.5	49
	July-Sept.	19.6	9.7	9.9	49
	Oct.-Dec.	21.0	10.5	10.5	50
	Average	**19.8**	**9.9**	**9.9**	**50**
1951	Jan.-Mar.	21.7	11.1	10.6	51
	Apr.-June	21.7	10.8	10.9	50
	July-Sept.	22.2	11.2	11.0	50
	Oct.-Dec.	22.7	11.7	11.0	52
	Average	**22.1**	**11.2**	**10.9**	**51**
1952	Jan.-Mar.	23.1	12.0	11.1	52
	Apr.-June	22.7	11.4	11.3	50
	July-Sept.	23.2	11.9	11.3	51
	Oct.-Dec.	23.8	12.3	11.5	52
	Average	**23.2**	**11.9**	**11.3**	**51**
1953	Jan.-Mar.	23.1	11.6	11.5	50
	Apr.-June	22.3	10.7	11.6	48
	July-Sept.	22.8	11.0	11.8	48
	Oct.-Dec.	23.2	11.3	11.9	49
	Average	**22.8**	**11.1**	**11.7**	**49**
1954	Jan.-Mar.	22.8	10.7	12.1	47
	Apr.-June	21.8	9.8	12.0	45
	July-Sept.	22.3	10.3	12.0	46
	Oct.-Dec.	22.8	10.7	12.1	47
	Average	**22.4**	**10.4**	**12.0**	**46**
1955	Jan.-Mar.	22.5	10.2	12.3	45
	Apr.-June	22.0	9.8	12.2	45
	July-Sept.	22.4	10.3	12.1	46
	Oct.-Dec.	23.1	10.7	12.4	46
	Average	**22.5**	**10.2**	**12.3**	**45**
1956	Jan.-Mar.	22.9	10.4	12.5	45
	Apr.-June	22.8	10.2	12.6	45
	July-Sept.	23.5	10.7	12.8	46
	Oct.-Dec.	24.0	11.2	12.8	47
	Average	**23.3**	**10.6**	**12.7**	**45**
1957	Jan.-Mar.	23.9	10.9	13.0	46
	Apr.-June	23.6	10.4	13.2	44
	July-Sept.	24.1	10.8	13.3	45
	Oct.-Dec.	25.0	11.4	13.6	46
	Average[4]	**24.2**	**10.9**	**13.3**	**45**

[1] Weighted average price of milk delivered to homes and sold in retail stores, based mainly on price quotations for single-quart purchases.

[2] Payment received by farmer for 2 18 lb. of Class I milk.

[3] Difference between retail cost and farm value.

[4] Preliminary.

The average farm-retail price spread in 1957 was 40 per cent more than in 1947–49. Most of the increase was caused by advances in wages and in prices of goods and services that milk dealers must buy; profits of 10 leading dairy companies were the same. The price spread, however, has not risen as much as wage rates and prices of many of the things dealers buy.

Higher Wages and Prices

The cost of labor, which amounted to over half of the farm-retail price spread in 1957, has risen since World War II. Estimates derived from data gathered in nationwide surveys of milk dealers conducted by the University of Indiana for the Milk Industry Foundation and other sources indicate that the labor cost per quart of milk handled was 45 percent higher in 1957 than in 1947–49. Data relating specifically to average hourly earnings of employees of fluid milk dealers are not available. Establishments that distribute milk and cream are included by the Bureau of Labor Statistics in the retail food and liquor store group. The hourly earnings in this group of establishments increased by 51 percent between 1947–49 and 1957. The labor cost per unit of product in marketing milk has not risen by as large a percentage as hourly earnings, because the number of units handled per man-hour has increased.

Next to labor, containers represent the largest single element of cost in marketing fluid milk. Wholesale price indexes published by the BLS provide indications of changes in prices of several of the more important items bought by milk marketing firms.

According to these indexes, prices of container paperboard were 25 percent higher in 1957 than the average for 1947–49 and prices for glass containers were 59 percent higher. Fuel used in dairy plants (mainly for providing hot water and steam) and electric power are other important items. Charges for manufactured and natural gas averaged about 16 percent more than in 1947–49, prices of fuel oil were about 42 percent higher, and prices of bituminous coal were 22 percent up. But electric power was 5 percent cheaper than in the earlier period.

Costs of operating milk delivery

trucks have increased considerably. The prices of trucks were about a third higher in 1957 than in 1947–49. Thus, depreciation costs have risen. Costs of repairs, tires, tubes, and gasoline have all increased.

Many firms have built new plants or have enlarged old plants and installed new equipment. Increases in building costs and in prices of equipment are reflected in depreciation charges which have risen 34 percent during the 1952–57 period. However, improvements in plant and equipment have helped to hold down processing costs.

Rents, State and local taxes, advertising rates, and most other expense items have increased in recent years.

Product Improvement

Dairy farmers and milk dealers have improved the quality of fluid milk in recent years but the improvement has not had much effect on the farm-retail price spread. Greater care is taken in producing and processing milk; one example is a trend toward requiring milk to be delivered from farms to plants at not more than 50° F. as compared with 60° formerly. More and more fluid milk is homogenized. Few small communities were without a supply of pasteurized milk at the end of World War II, and fewer still remain today. But the effect which these changes have had on costs per quart of milk are exceedingly small.

Profits

Data are not available on profits that dairy marketing firms made on fluid milk, separately from other products, during most of the years considered. Profits (before taxes on income) that 10 of the leading dairy-product firms made on all their sales, including manufactured dairy products and some nondairy products as well as fluid milk, have varied since 1947 between 4.1 percent of sales in 1948 to 6.0 percent in 1950 (fig. 7). The 1947–49 average was 4.6 percent and the average for 1957 was 4.9 percent. Their profits (after taxes) expressed as a percentage of net worth, have varied from 9.9 percent in 1952 to 14.5 percent in 1949 (fig. 8). The 1947–49 ratio was 13.4 percent and that for 1957 was 12.1 percent. Profit data for several recent years are available for milk dealers surveyed by the University of Indiana for the Milk Industry Foundation.[1] Their net profits (after taxes) as a percentage of sales were: 1.7 percent in 1947, 2.1 in 1949, 1.4 in 1952, 2.1 in 1953, 2.3 percent in 1954, and 2.2 percent in 1955 and 1956.

A dairy firm would have had a larger profit on a quart of milk in 1957 than in 1947–49, provided its profit as a percentage of sales was the same in both periods, because the retail price of milk was about 25 percent higher in 1957 than in the earlier period.

[1] The number of firms surveyed varied from 244 in 1947 to 425 in 1956.

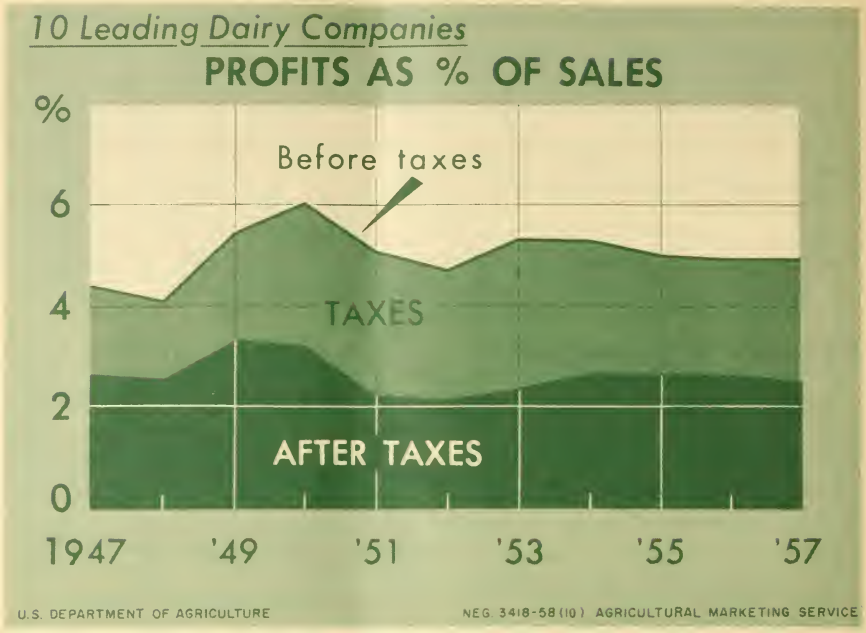

FIGURE 7.

MEASURES TO REDUCE MARKETING COSTS

The effect on the price spread of rising wage rates and prices has been partly offset by reductions in marketing services. One of the more significant of these developments is the less frequent delivery of milk to homes. The practice of every-other-day delivery, adopted during World War II, was continued after the war. And during recent years, delivery has been reduced to 3 days a week in most cities.

Another development which has tended to hold down the average price spread is the increase in the quantity of milk sold in retail stores relative to that delivered to homes. In most markets, the spread is smaller on milk sold through stores than on that delivered to homes. During recent years, the average price per quart paid by urban consumers in retail stores has been more than 1 cent lower than the average for delivered milk.[2] The distribution cost is less for milk sold by retail stores than for that delivered to homes, but the average processing and container cost perhaps is higher for milk sold in stores because the proportion in paper containers is larger.

[2] The retail price used in calculating the price spread is a weighted average of the prices reported by the Bureau of Labor Statistics for milk sold in retail stores and for that delivered to homes. To reflect the increase in the proportion sold in retail stores, the weight given the average retail store price has been gradually increased.

The cost of assembling milk usually has been reduced where tank trucks have come into use. The manual labor required to load cans into the pickup van at the farm and unload, weigh, dump, wash, and reload them at the plant is eliminated. The saving is partly offset, however, by the task of weighing the milk at the farm and cleaning the truck tank.

In many instances milk stored in a refrigerated tank at the farm is collected every other day. Less frequent collection reduces truck operating costs. But before tank trucks can be used, dairy farmers must incur the expense of installing refrigerated storage tanks and other equipment. The use of these tanks generally reduces the milk dealer's costs, and he frequently pays a premium price for bulk milk. Every-other-day or less frequent collection and the use of tank trucks have increased the distance it is feasible to haul milk from farms to receiving plants. This has decreased the need for country receiving plants and more and more milk is being hauled directly to city plants.

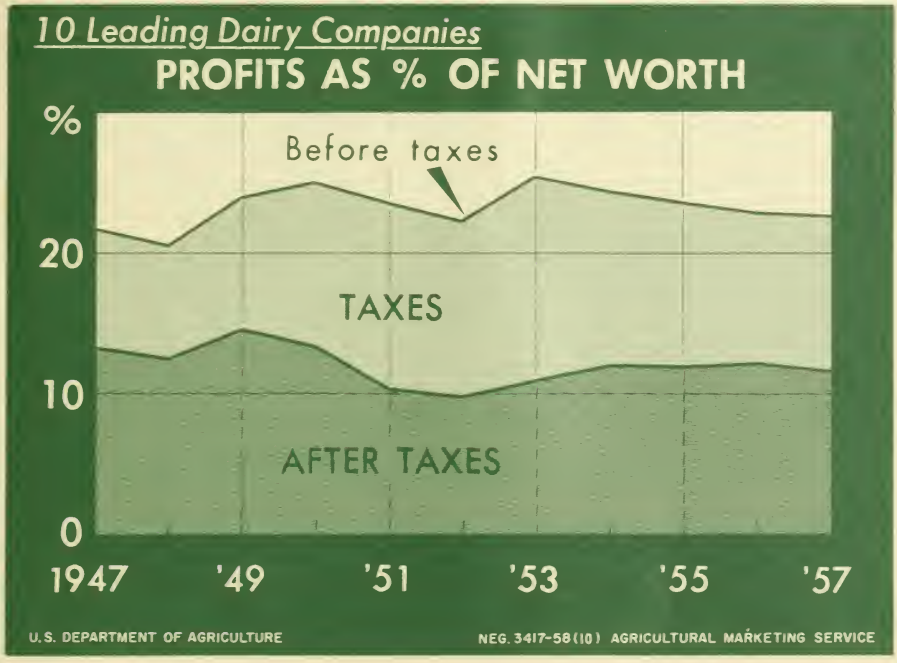

FIGURE 8.

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